

Shri Ramdeobaba College of Engineering & Management, Nagpur.

Department of Mechanical Engineering

Engineering Drawing Practical Problem Sheet

Sheet No.:- 1.

Scales and Curves

(Manual)

1. On a map, the distance of 11 kilometers is shown by a 22 cm long line. Find the RF. Construct the vernier scale of this RF to read decameters and measure up to 4 kilometers. Show the following distances.  
1) 0.35km 2) 1.19km 3) 2.57km
2. The area of a field is 50,000 sq. m the length and breadth of the field, on the map is 10 cm and 8 cm respectively. Construct a diagonal scale, which can read up to one meter. Mark the lengths of 235 meter and 62 meter on the scale. What is RF of the scale?
3. Two fixed points A and B are 100 mm apart. Trace the complete path of a point P is moving (in the same plane as that of A and B) in such a way that the sum of its distance from A and B is always the same and equal to 125 mm. Name the curve.
4. A cricket ball thrown up reaches the maximum height of 50 m and falls on the ground at a distance 125 m from the point of projection. Draw the path of cricket ball and name the curve. Assume the path of projection is from the ground level.
5. Two straight lines OA and OB make an angle of  $75^{\circ}$  between them. P is a point 40 mm from OA and 50 mm from OB. Draw a hyperbola through P, with OA and OB as asymptotes.

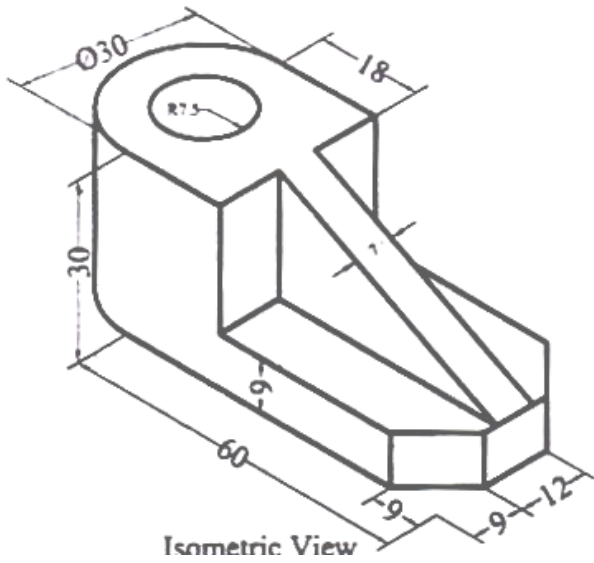


Fig. No.:- 1

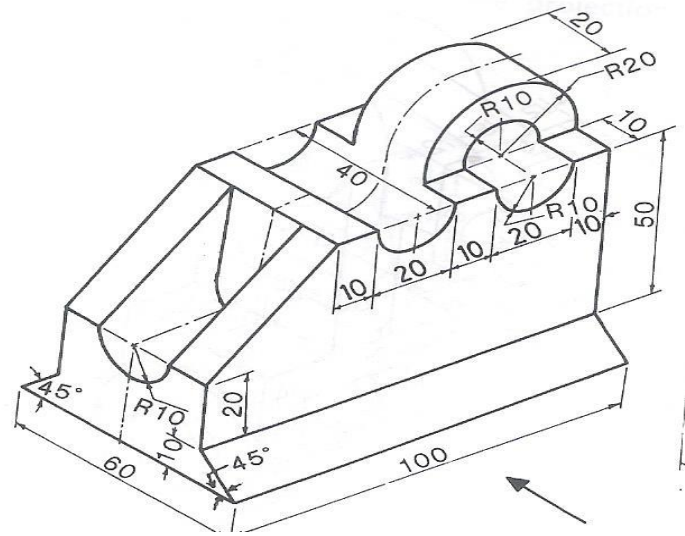


Fig. No.:- 2

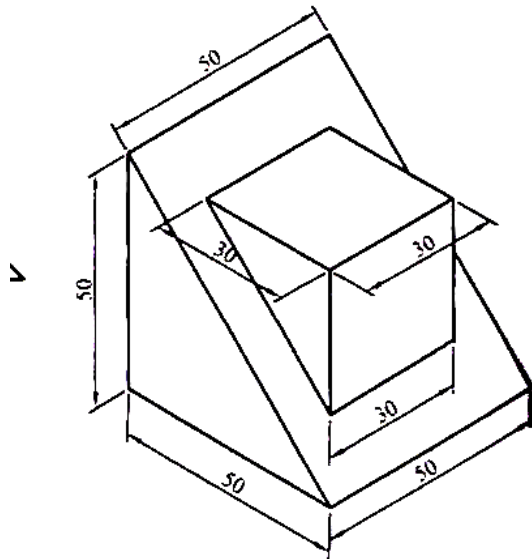


Fig. No.:- 3

Figure 1: Draw FV and TV

Figure 2: Draw FV & TV

Figure 3: Draw FV, TV & SV

1. A line AB 90 mm long is inclined at  $45^\circ$  with HP and its Top view makes an angle of  $60^\circ$  with VP. The end A is in HP, & 12 mm in front of VP. Draw the projections and find its inclination with VP.
2. The Front view of a 90 mm long line PQ measures 60 mm and its Top view measures 70 mm. Its end Q and the mid-point M are in first quadrant, M being 40mm from both the planes. Draw the projections of line PQ.
3. A line AB, 75mm long, has one end A in VP. Other end B is 15 mm above HP and 50 mm in front of VP. Draw the projections of the line when sum of its Inclinations with HP & VP is  $90^\circ$ , means it is lying in a profile plane. Find true angles with reference planes.
4. A and B are the ends of a straight line AB. The end A is 65mm above HP and 40mm in front of VP. The end B is 15mm above HP and 75mm in front of the VP. The distance between the projectors along XY line is 65mm. Draw the projections of the line AB and determine its inclination with HP and VP.

1. A rectangular room, a peg is drawn at the centre of the floor. Another peg is drawn at the midpoint of the common edge between the two mutually perpendicular walls. The minimum length of the thread connecting these two pegs is 5.5m. The thread makes  $30^\circ$  with the floor. The TV of the thread makes  $40^\circ$  with the longer wall. Find graphically the size of the room.
2. A wireless axial tower 20m high is tied by two guy ropes, having angles of depression  $30^\circ$  and  $40^\circ$ . Other ends of the ropes are tied at two towers of height 5m and 7.5m respectively and 15m apart. Draw projections of guy ropes and find their true lengths.
3. Three vertical poles AB, CD & EF are respectively 5, 8 & 12 meters long. Their ends B, D & F are on the ground and lie at the corners of an equilateral triangle of 10 m long sides. Determine graphically the distance between the top ends of the poles, i.e. AC, CE, & EA.

1. Draw the projections of a circle of 75 mm diameter having the end A of the diameter AE in the HP, the end E in the VP, and the surface inclined at  $30^{\circ}$  to the HP and at  $60^{\circ}$  to the VP.
2. A regular pentagon of 30 mm sides is resting on HP on one of its sides with its surface  $45^{\circ}$  inclined to HP. Draw its projections when the side in HP makes  $30^{\circ}$  with VP.
3. A rhombus of diagonals 40 mm and 70 mm long respectively having one end of its longer diagonal in HP while that diagonal is  $45^{\circ}$  inclined to HP and makes  $30^{\circ}$  inclinations with VP. Draw its projections.
4. A semicircular plate of 80 mm diameter has its straight edge in the VP, and inclined at  $45^{\circ}$  to the HP. The surface of the plate makes an angle of  $30^{\circ}$  with the VP. Draw its projections.

1. A hexagonal prism, base 30 mm side and axis 75 mm long, has an edge of the base parallel to the HP and inclined at  $45^{\circ}$  to the VP. Its axis makes an angle of  $60^{\circ}$  with the HP. Draw its projections.
2. Draw the projections of cone, base 50 mm diameter and axis 75 mm long, lying on a generator on the ground with the top view of the axis making an angle of  $45^{\circ}$  with the VP.
3. Draw the three views of a cube of side 60 mm when solid diagonal is parallel to H.P. and perpendicular to V.P.
4. A pentagonal pyramid, side of base 30mm and height 70mm rests on one of the corners of its base on HP the base being tilted up until the vertex is 60mm above HP. Draw three views of the pyramid with the edge of the base opposite to the corner on which it is resting made inclined at  $60^{\circ}$  to VP.

1. A cone, base 65 mm diameter and axis 75 mm long, is lying on the ground on one of its generators with the axis parallel to the VP. A section plane which is parallel to VP cuts the cone 6 mm away from the axis. Draw the sectional front view and development of the surfaces of the remaining portion of the cone.
2. A cube of 40mm long edges is resting on the ground on one of the faces with vertical faces equally inclined to the VP. A section plane perpendicular to the VP and inclined to the HP cuts the solid in such a way that the true shape of the section is an equilateral triangle of side 50mm. Determine the inclination of the section plane with the HP and draw the sectional top view and true shape of the section. Draw the development of the cut solid.
3. A pentagonal pyramid, base 30mm side and axis 60 mm long is lying on one of its triangular faces on the HP with the axis parallel to the VP. A vertical section plane, whose HT bisects the top view of the axis and makes an angle of  $30^\circ$  with the reference line, cuts the pyramid removing its top part. Draw the top view, sectional front view and true shape of the section and development of the surface of the remaining portion of the pyramid.

Draw Isometric View for Figure 1 & Isometric Projection for Figure 2, Figure 3

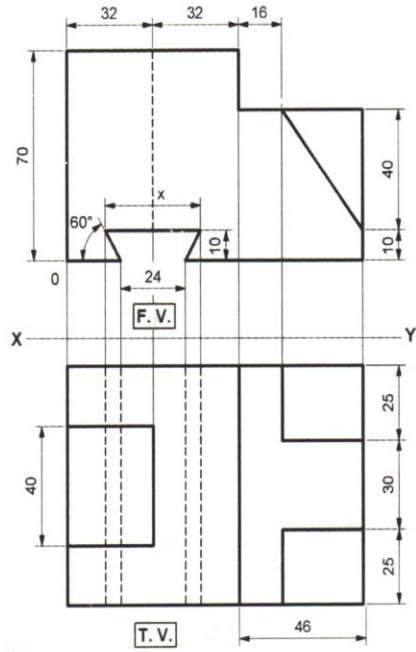


Figure No. 1

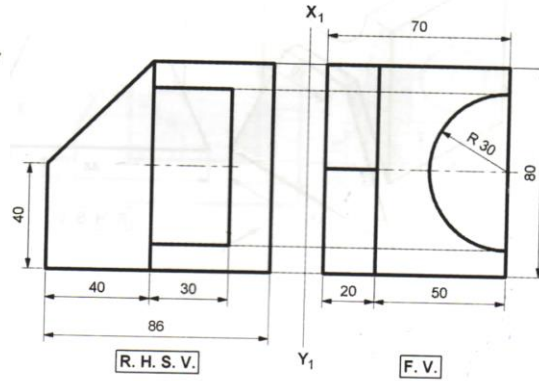


Figure No. 2

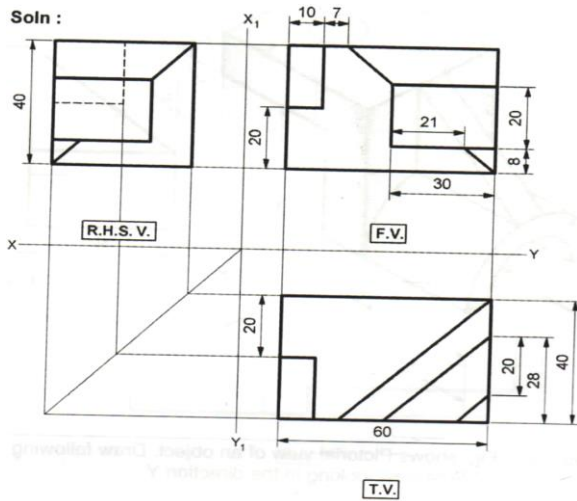


Figure No. 3

